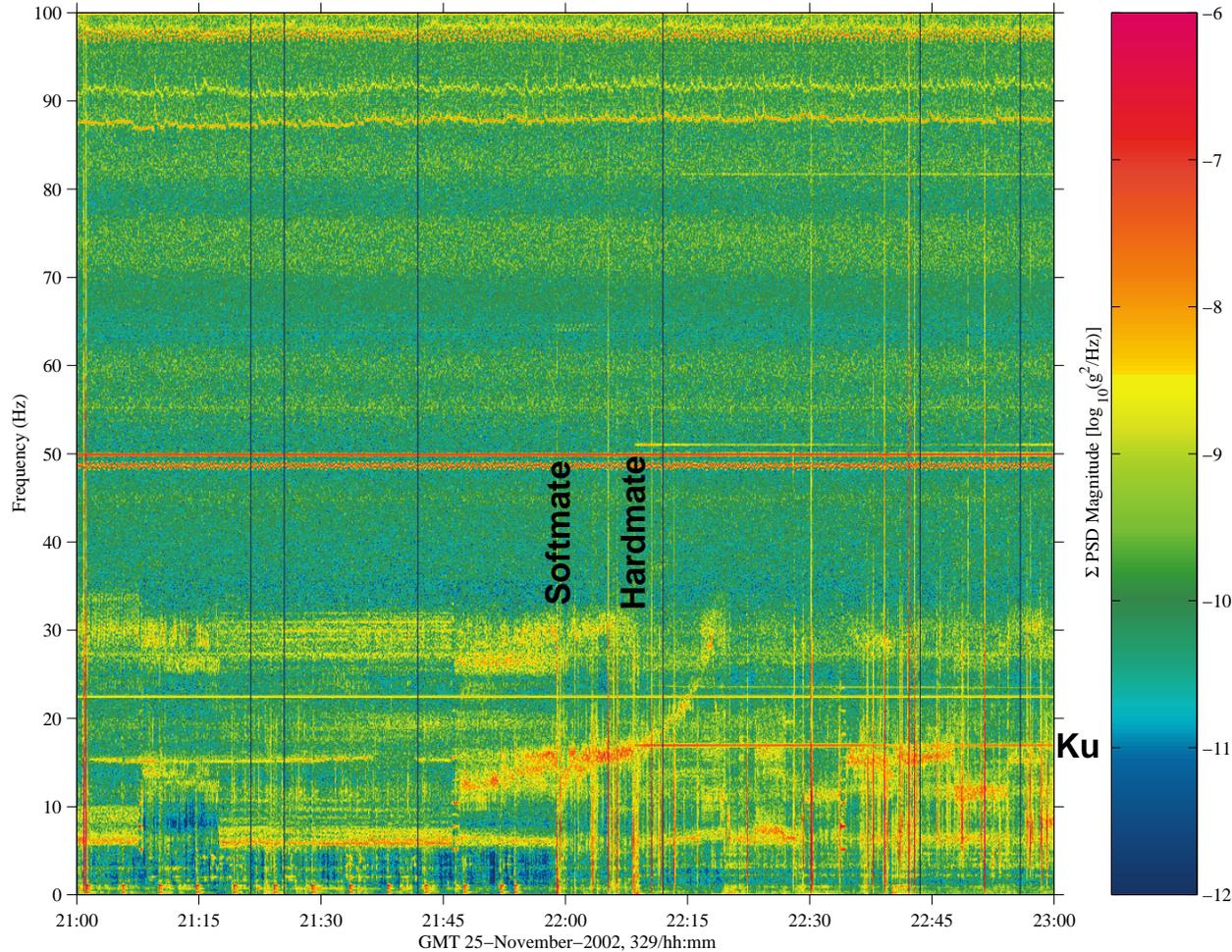


Shuttle Docking QUALIFY

sams2, 121f02 at LAB1O2, ER1, Drawer 1:[128.73 -23.53 144.15]
250.0 sa/sec (100.00 Hz)
 $\Delta t = 0.122$ Hz, Nfft = 2048
Temp. Res. = 8.192 sec, No = 0

STS-113 Docking

Increment: 5, Flight: UF2
Sum
Hanning



Data Description	
Sensor	121f02 250.0 sa/sec (100.00 Hz)
Location	LAB1O2, ER1, Drawer 1
Inc/Flight	Increment: 5, Flight: UF2
Plot Type	spectrogram

Notes:
The Shuttle docks at the forward end of the US Lab to a Pressurized Mating Adapter (PMA-2). Initial contact is referred to as “softmate” even though its impact is typically greater in magnitude than the “hardmate” event. A typical Shuttle docking is as follows:

- (1) initial contact and capture (softmate)
- (2) pause several minutes to let relative motion between the two spacecraft damp out
- (3) drive latches to make solid mechanical connection (hardmate)

Upon completion of the hardmate, the two spacecraft effectively become one structure from a vibratory acceleration transmission perspective. This is usually evidenced by measurements made on the space station, which show the signature of the Shuttle’s Ku-band antenna. This antenna is nearly continuously dithered at 17 Hz to prevent mechanical stiction and usually is accompanied by higher harmonics (most notably 34 and 51 Hz).

Regime:	Vibratory
Category:	Vehicle
Source:	Shuttle Docking



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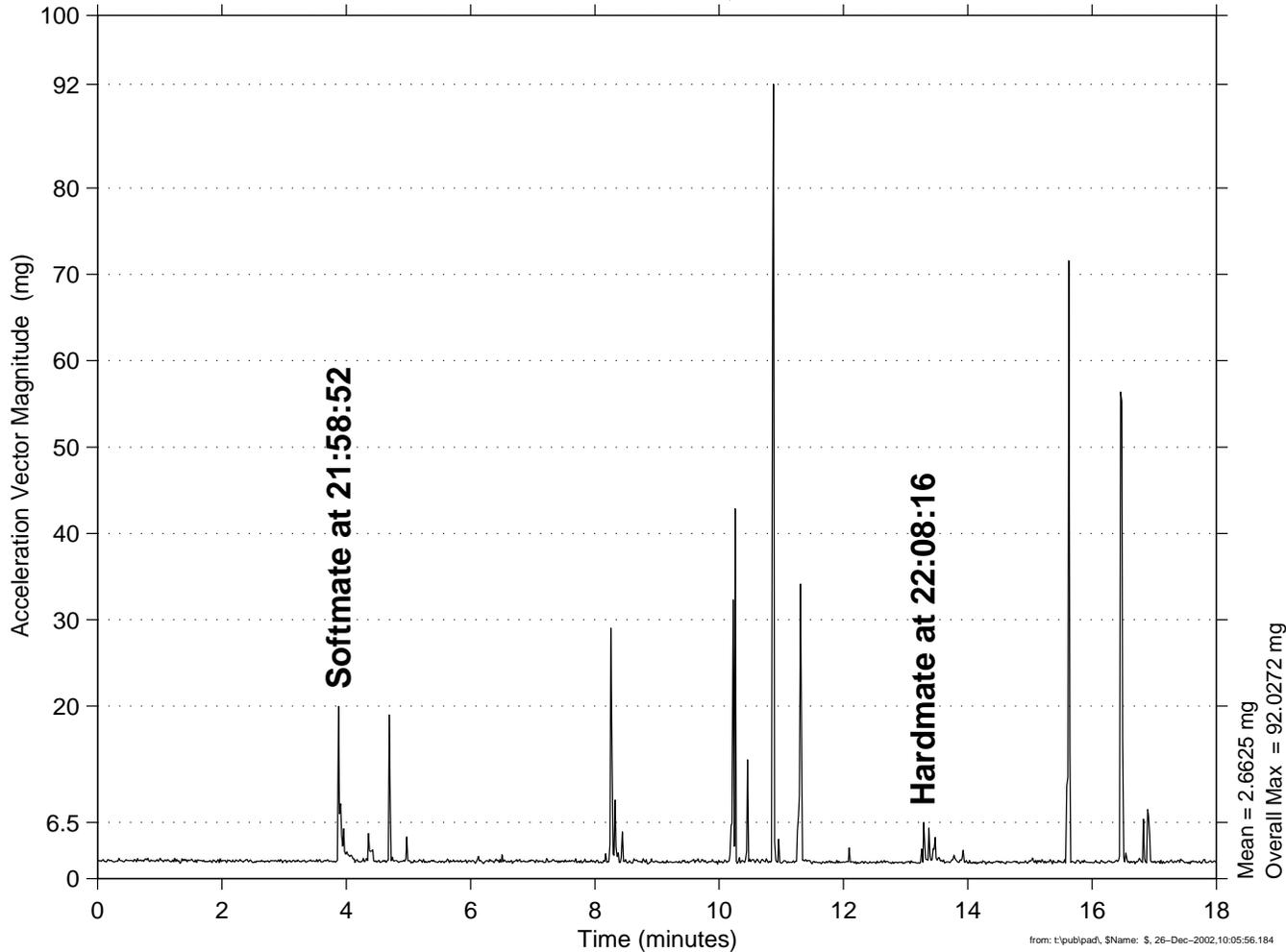
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Shuttle Docking QUANTIFY

sams2, 121f02 at LAB1O2, ER1, Drawer 1:[128.73 -23.53 144.15]
250.0 sa/sec (100.00 Hz)

Increment: 5, Flight: UF2
Vector Magnitude
Interval Max
Size: 1.00, Step: 1.00 sec.

STS-113 Docking
Start GMT 25-November-2002, 329/21:55:00.003



Data Description

Sensor	121f02 250.0 sa/sec (100.00 Hz)
Location	LAB1O2, ER1, Drawer 1
Inc/Flight	Increment: 5, Flight: UF2
Plot Type	interval max

Notes:

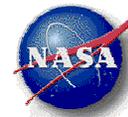
The 1-second interval max plot is annotated to show the STS-113 Shuttle docking sequence:

- (1) initial contact and capture at about the 4-minute mark; **softmate: 20 mg**
- (2) pause about 10 minutes to allow the relative motion between the two spacecraft dampen out
- (3) drive latches to make solid mechanical connection; **hardmate: 6.5 mg**

This interval max plot also shows that other impulsive events can dwarf the primary docking impact events. In this case, a peak acceleration of about 92 mg took place between the softmate and hardmate events.



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PIMS ISS Acceleration Handbook
Date last modified 12/30/02

Regime:	Vibratory
Category:	Vehicle
Source:	Shuttle Docking